RSW POST-CONSTRUCTION EVALUATION OF PASSAGE AND SURVIVAL FOR RADIO-TAGGED YEARLING CHINOOK SALMON AND JUVENILE STEELHEAD AT LOWER MONUMENTAL, 2008

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ABSTRACT

In 2008, NOAA Fisheries evaluated passage behavior and estimated relative survival for radio-tagged river-run yearling Chinook salmon and juvenile steelhead related to operation of a removable spillway weir (RSW) at Lower Monumental Dam on the Snake River. Fish were PIT tagged and surgically implanted with a radio transmitter at Lower Monumental Dam. The treatment groups comprised 1,214 yearling Chinook salmon and 1,208 juvenile steelhead released 5 km below Little Goose Dam. The reference groups comprised 1,001 yearling Chinook salmon and 1,007 juvenile steelhead released into the tailrace of Lower Monumental Dam. Releases occurred during both daytime and nighttime operations for 26 days from 28 April to 23 May. Project operations during the evaluation included spill 24 hours per day. River flow, percent spill, and tailwater elevation during releases averaged 103 kcfs, 33%, and 441 ft msl, respectively.

Yearling Chinook salmon

Median forebay delay was 2.2 hours. The highest percentage of fish (43%) first approached the spillway portion of Lower Monumental Dam near the middle of the dam in the vicinity of the RSW in spillbay 8. Passage distribution was 62, 28, 6, and 4% through the spillway, juvenile bypass system (JBS), turbines, and undetermined routes, respectively. The highest percentage of fish (45%) passed through the RSW in spillbay 8. For fish with a known passage route, fish guidance efficiency (FGE) was 83%, and fish passage efficiency (FPE) was 94%. Median tailrace egress was 7 minutes overall. Spill efficiency was 1.96 to 1 and RSW efficiency was 6.79 to 1.

Relative survival was estimated from detections of treatment and reference groups at a series of downstream telemetry transects between Lower Monumental Dam on the lower Snake River and McNary Dam on the lower Columbia River. Relative dam survival was 0.934 (95% CI, 0.902–0.968). Relative survival for fish passing through the spillway, RSW, and JBS was 0.976 (95% CI, 0.942–1.011), 1.007 (95% CI, 0.974–1.040), and 0.910 (95% CI, 0.830–0.996), respectively.

Juvenile Steelhead

Median forebay delay was 2.2 hours. The highest percentage of fish (48%) first approached the spillway portion of Lower Monumental Dam near the middle of the dam in the vicinity of the RSW in spillbay 8. Passage distribution was 80, 17, 1, and 2% through the spillway, JBS, turbines, and undetermined routes, respectively. The highest percentage of fish (70%) passed through the RSW in spillbay 8. For fish with a known passage route, FGE was 93% and FPE was 99%. Median tailrace egress was 5 minutes overall. Spill efficiency was 2.50 to 1 and RSW efficiency was 10.31 to 1.

Relative dam survival was 0.982 (95% CI, 0.983–1.005). Relative survival for fish passing through the spillway, RSW, and JBS was 1.014 (95% CI, 0.990–1.037), 1.026 (95% CI, 1.004–1.048), and 1.002 (95% CI, 0.901–1.114), respectively.